FMFRP 0-13

Marine Combat Water Survival

U.S. Marine Corps

PCN 140 000130 00

FMFRP 0-13, *Marine Combat Water Survival*, is dedicated to the Marines who have perished at sea defending their country. It is especially dedicated to the Marines and Sailors of Kilo Company, Third Battalion, Eighth Marines, who perished at sea in the spring of 1979.

DEPARTMENT OF THE NAVY
Headquarters United States Marine Corps
Washington, D.C. 20380-0001

16 September 1991

FOREWORD

1. PURPOSE

The Fleet Marine Force Reference Publication (FMFRP) 0-13, *Marine Combat Water Survival*, provides techniques, procedures, and training standards for Marine water survival. This publication addresses a Marine's ability to cross water obstacles and perform water rescues.

2. SCOPE

This publication guides individual Marines and small-unit leaders in the proper techniques and training requirements of combat water survival. Small-unit leaders should use this publication to prepare Marines for the Marine combat water survival program (MCWSP). Once a unit has completed the MCWSP, small-unit leaders should use this publication as a refresher course before water operations. The techniques and procedures contained in this publication reflect current Marine Corps methodology.

3. SUPERSESSION

FMFRP 0-13 supersedes previous Marine Corps and Red Cross guidance where differences exist.

4. CHANGES

Recommendations for improvements to this publication are encouraged from commands as well from individuals. Forward suggestions using the User Suggestion Form format to—

Commanding General
Doctrine Division (C 42)
Marine Corps Combat Development Command
2042 Broadway Street Suite 210
Quantico, VA 22134-5021

5. CERTIFICATION

Reviewed and approved this date.

BY DIRECTION OF THE COMMANDANT OF THE MARINE CORPS

M. P. CAULFIELD
Major General, U.S. Marine Corps
Deputy Commander for Warfighting
Marine Corps Combat Development Command
Quantico, Virginia

DISTRIBUTION: 140 000130 00

User Suggestion Form

From:

To: Commanding General, Doctrine Division (C 42), Marine Corps Combat Development Command, 2042 Broadway Street Suite 210, Quantico, Virginia 22134-5021

Subj: RECOMMENDATIONS CONCERNING FMFM 0-13, *MARINE COMBAT WATER SURVIVAL*

1. In accordance with the foreword to FMFM 0-13, which invites individuals to submit suggestions concerning this FMFM directly to the above addressee, the following unclassified recommendation is forwarded:

Page	Article/Paragraph No.	Line No.	Figure/Table No.

Nature of Change:

- ☐ Add
- ☐ Delete
- ☐ Change
- ☐ Correct

2. Proposed new verbatim text: (Verbatim, double-spaced; continue on additional pages as necessary.)

3. Justification/source: (Need not be double-spaced.)

Note: Only one recommendation per page.

Record of Changes

Change No.	Date of Change	Date of Entry	Organization	Signature

(reverse blank)

Marine Combat Water Survival

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Appendixes:

HISTORICAL PRECEDENTS

Throughout history, water has posed special challenges to soldiers and sailors in both peace and war. Combat units, confident of their ability to work in and on the water, use water obstacles to affect the outcome of a campaign. The peril presented by water demands all personnel receive proper water survival training. History abounds with disasters at sea. Many of these tragedies could have been prevented or at least reduced in scale if water survival techniques had been properly emphasized. The following example illustrates water's destructive power.

On Sunday, July 29, 1945, the heavy cruiser *USS Indianapolis* was en route to the Philippine Sea, carrying vital materials for the first atomic bomb. Shortly before midnight (about 39 hours out of port), the *Indy*, running blacked out and unescorted, was rocked by two explosions on her starboard side. With communications smashed, the ship was unable to signal its distress and sank within 15 minutes.

Three life rafts and a floater net supported a few survivors, but the rest drifted about, held up by rubber life belts or Mae Wests. About 60 seamen died the first night.

Survivors assumed the ship would be reported overdue in Leyte, and they would be rescued within 2 days. Throughout the next several days, in-transit aircraft flew nearby without spotting the desperate seamen. As best they could, the men kept together, some tying long ropes to each other, floating like corks on a net.

By Monday evening, panic began to set in as some life jackets lost their buoyancy from the long immersion. Some men even fought over life jackets resulting in at least 25 deaths. No one dared sleep, for fear of losing his jacket.

Not until late Thursday morning, 3½ days after the ship sank, were the men discovered. A plane on a routine flight over the area luckily spotted the survivors. When surface ships picked them up that night, the survivors learned they had never been reported overdue. Of the 1,196-man crew, everyone was a casualty. Eight hundred and eighty were listed dead or missing. In this instance, the innovative and expedient use of flotation devices and float techniques saved hundreds of lives.

DROWNING

Drowning is a form of suffocation. A drowning victim inhales water into the lungs, or his throat closes by reflex so that little or no water enters the windpipe. In either case, a victim can no longer breathe.

Freshwater Drowning

Freshwater drowning is difficult to treat. As a victim loses consciousness and slips beneath the water, the heart is still beating but the airway is blocked. After the victim loses consciousness, throat muscles relax and the airway opens. Water rushes into the lungs and enters the bloodstream. Within seconds, the volume of liquid in the bloodstream increases by as much as 50 percent. Meanwhile, the heart races at a very high rate because of the lack of oxygen. The heartbeat continues to increase as the blood thins. The increased strain on the heart, combined with thinning of the blood, makes cardiopulmonary resuscitation (CPR) less effective. Begin CPR immediately and continue CPR until medical help arrives.

Saltwater Drowning

Saltwater drowning is similar to freshwater drowning. The major difference is the water's saline content and its effect on the lungs. Salt water draws blood into the lung tissue and makes it difficult for the lungs to transfer oxygen to the blood. Begin CPR immediately and continue CPR until medical help arrives.

Drowning Symptoms

A drowning victim often calls for help and has an expression of dread or panic. Another symptom includes thrashing at the water's surface. If thrashing stops or grows calmer, the victim is overcome by fatigue, hypothermia, or a lack of air. At this stage, the victim has 1 or 2 minutes before going under the surface.

Treatment

If the victim is not breathing, begin rescue breathing. Place the victim on his back, pinch the nose, and give two full breaths. Check for a pulse. If a pulse is present, but the victim is not breathing, continue rescue breathing. If a pulse is not present, begin CPR. See FMFRP 4-52, *First Aid*, for rescue breathing and CPR details.

HYPOTHERMIA

Hypothermia is the abnormal lowering of the body's internal temperature. Hypothermia occurs when the body loses heat faster than the body produces it. The chilling effects of cold air, wind, and water produce hypothermia. Water poses the greatest threat. Water steals a victim's body heat 25 times faster than air.

In water less than 70 degrees Fahrenheit, a victim's skin and outer tissues cool quickly and the heart and brain begin to cool. A hypothermia victim loses the ability to move quickly, slips into semiconsciousness, lapses into a coma, and dies when internal temperatures drop too low. Depending on the water temperature, this process can take only a few minutes.

Sudden contact with cold water can set off a body reaction known as the mammalian diving reflex. This reflex can greatly increase survival time (especially for women and children) in or under cold water. The mammalian diving reflex shuts off blood circulation except the flow between the heart, lungs, and brain. The small amount of oxygen left in the blood and lungs is saved for the body's vital organs. The mammalian diving reflex has allowed people to survive over half an hour under cold water with no brain damage. Therefore, treat a cold water drowning victim as though he is still alive.

WARNING

*If the victim **has no pulse or is not breathing**, GIVE CPR OR RESCUE BREATHING IMMEDIATELY. Continue first aid until medical help arrives.*

*If the victim **has a pulse or is breathing**, DO NOT GIVE CPR. CPR could prove fatal.*

Hypothermia Symptoms

Once the body's core temperature drops, the victim shows one or more of the following symptoms:

- Begins shivering violently and uncontrollably as the body tries to warm itself.
- Speaks slowly or in a slurred voice.
- Appears disoriented or poorly coordinated.
- Loses skin color, and lips are blue and pinched.
- Stops shivering and becomes rigid.

Survival Time

A hypothermia victim's survival depends on water temperature and time spent in the water. The following also affect survival rate:

- Extra clothing—extra clothing **increases** survival time.
- Activity—remaining motionless in the water **increases** survival time.
- Body fat—extra body fat **increases** survival time.
- Body size—a large build **increases** survival time.

NOTE: A small build cools faster than a large build. This offsets a woman's extra body fat advantage. As a result, women cool about 15 percent faster than men. Children cool faster than adults.

Treatment

Treat hypothermia as quickly as possible. Consciousness of the victim determines treatment. A victim must be warmed

and further heat loss prevented. The following treatment procedures are recommended:

WARNING

If the victim has no pulse or is not breathing, GIVE CPR OR RESCUE BREATHING IMMEDIATELY. Continue first aid until medical help arrives.

If the victim has a pulse or is breathing, DO NOT GIVE CPR. CPR could prove fatal.

- Get the victim out of the elements and into shelter.
- Remove the victim's wet clothing.
- Put the victim in dry clothing.
- Place the victim in a sleeping bag if one is available.
- Place as much insulation as possible between the victim and the ground.
- Use hot water bottles, electric blankets, or blankets heated in an oven or by a campfire to apply heat to the victim's neck, groin, and sides of chest. It may be necessary to place another Marine in the sleeping bag with the victim.

CAUTION

Do not apply heat to extremities.

- If conscious, give the victim warm fluids. If able to eat, give candy or sweetened foods.
- If unconscious, place the victim on his back with head tilted back to ensure open airway.
- Do not massage the victim. Massage can break blood vessels and create swelling, internal pressure, and blocked blood circulation.

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- Do not give alcohol to the victim.
- Seek medical help immediately.

Determination of Death

Unconscious hypothermia victims may not be breathing, lack a pulse, and appear dead. Proceed with treatment procedures. A medical corpsman determines if the victim can be revived.

WATER RESCUES

Beginning at the combat water survival, second-class (CWS-2) level (see app. A), the Marine combat water survival program (MCWSP) stresses rescue techniques suitable to a combat environment. Avoid entering the water with the victim. A drowning victim reacts with unexpected violence and can seize and drown the rescuer. Enter the water as a last resort. Attempt a swimming rescue only if you are in good condition and there is no other way to help the victim.

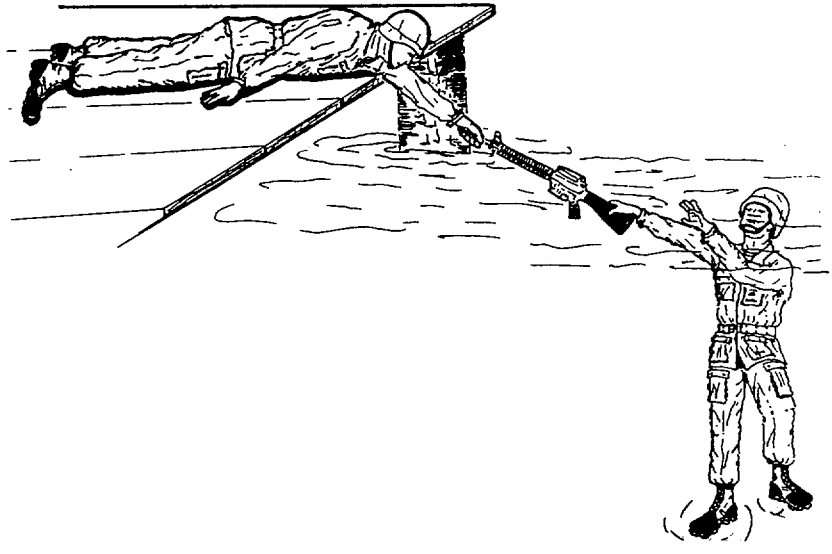
Specific instructions on rescue procedures follow on page 4-2, on rescue of an unconscious victim on page 4-8, and on self-defense against a drowning victim on page 4-9.

Rescue Procedures

Reach

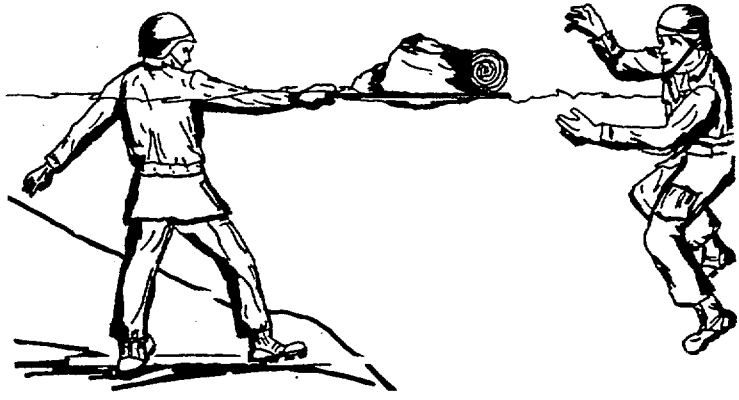
From a safe position at the water's edge, reach out to the victim. Talk constantly to calm the victim. Retain partial contact with land or some solid support structure (e.g., pier, bridge). If the victim is close but still beyond reach, extend an object (e.g., sticks, rifles with magazines removed and chambers empty, packs) that the victim can grasp. Once the victim is close to shore, enter the water to seize the victim.

NOTE: A foot can also be extended to the victim **if** the rescuer can retain a secure grip on a solid support structure.



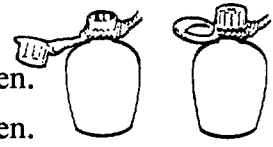
Wade

Do not enter water deeper than your chest. Talk constantly to calm the victim. If possible, do not directly touch the victim. Extend an object (e.g., a stick, a rifle with magazine removed and chamber empty, a pack) that the victim can grasp. Once the victim grasps the object, pull the victim slowly to safety.



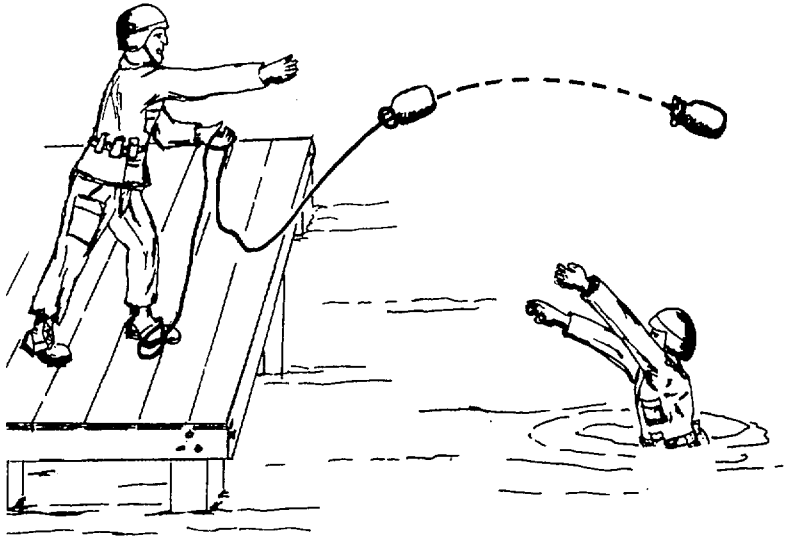
Throw

Use an expedient heaving line to throw a lifesaving device to the victim. Talk constantly to calm the victim. If a stream crossing appears dangerous, post a Marine with an expedient heaving line to rescue distressed swimmers. The following steps show preparation and use of an expedient heaving line during a throw rescue. Once the victim grasps the line, pull at a steady pace. Pull should keep the victim's head above the water's surface. DO NOT pull so strongly as to break the victim's grip.



1. Tie a bowline at one end of rope.
2. Unfasten lid of partially-filled canteen.
3. Place bowline around neck of canteen.
4. Refasten lid so canteen hangs from bowline loop.
5. Wrap end of rope around foot to secure. Stand with weight on wrapped rope.
6. Coil 20 to 30 yards of rope, and hold in nonthrowing hand.
7. Place canteen in throwing hand.

8. Use an underhand throw to pitch the canteen and coil a short distance past the victim. Rope trails across the victim's outstretched arms. Keep nonthrowing hand open so the second half of the coil can unfold freely.

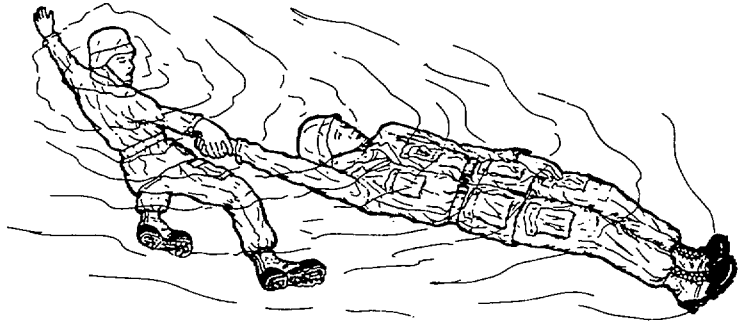


9. Retrieve the line if the throw is inaccurate or the victim fails to grasp the line. Recoil the line as it comes in.
10. Divide coil and throw again.

Wrist Tow

Use the wrist tow to rescue a victim floating face down. Do not use the wrist tow on a struggling victim. Swim toward the victim using a modified breast or crawl stroke. Stop within 6 feet of the victim to assess the victim's condition. The following steps show proper wrist tow procedures.

1. Approach victim from the front.
2. Grasp the underside of the victim's left wrist with the right hand, or the right wrist with the left hand.
3. Lean away, pulling and kicking strongly to move the victim into a horizontal face-up position.
4. Twist the wrist to rotate the victim into a face-up position.
5. Swim toward safety using sidestroke or elementary backstroke.
6. Retain a firm grip on the victim's wrist.
7. Keep towing arm fully extended. This allows you to escape if the victim revives and begins to struggle.
8. Ensure the victim's head does not go underwater during the recover part of your stroke cycle.



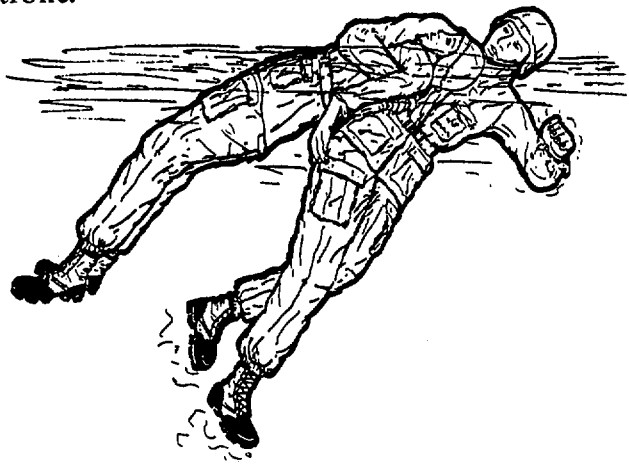
CAUTION

The cross-chest carry is very fatiguing even if you are in excellent physical condition.

Use the cross-chest carry to rescue victims struggling at the water's surface. Talk constantly to calm the victim. Swim toward the victim using a modified breast or crawl stroke. Stop within 6 feet of the victim to assess the victim's condition. The following steps show proper cross-chest carry procedures:

1. Grasp victim's right armpit with right hand, or left armpit with left hand.
2. Lean away, pulling and kicking strongly to move the victim into a horizontal face-up position.

3. Retain grip on victim's armpit and reach over victim with free hand to encircle victim's chest.
4. Release armpit once grip on victim's chest is secure.
5. Swim toward safety using sidestroke or elementary backstroke.



These procedures bring the victim's face and shoulders clear of the water and usually cause him to cease struggling. Keep a firm grip on the victim's chest. Sometimes, the victim will fight during the swim to safety. If this happens, release the victim and reassess the situation.

Rescue of an Unconscious Victim

Evaluate an unconscious drowning victim. Immediate first aid can save the victim's life and prevent possible brain damage. First, open the airway and check for breathing. If the victim is not breathing, give two breaths of air and remove the victim from the water as soon as possible. Once out of the water, check for a pulse. If a pulse is present and the victim is not breathing, start rescue breathing. If a pulse is not present, start CPR. Continue CPR until medical help arrives.

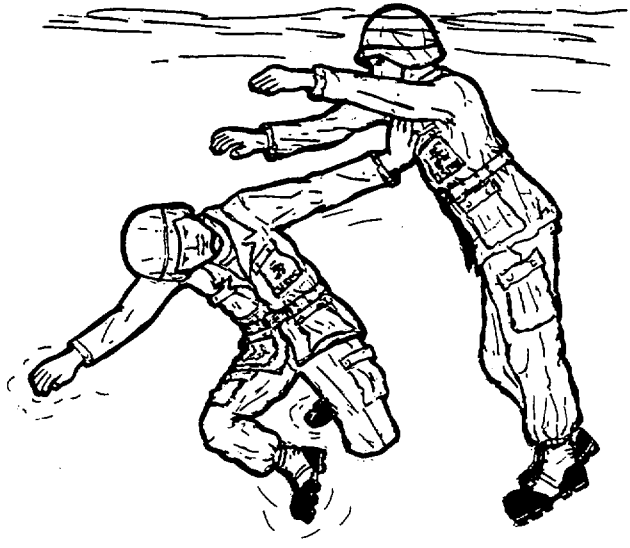
Defense Against Drowning Victims

A struggling drowning victim poses great danger to anyone near him. Driven by panic, the victim can grab you with great strength in an effort to climb out of the water. This can result in the death of both you and the victim. The MCWSP emphasizes the following techniques to defend against a drowning victim. These techniques work well, but the best defense against attack by the victim is to stay out of his reach. Do not sacrifice your life in an attempt to save the victim.

Block

The block technique prevents the victim from grasping you if you have unwisely approached the victim from the front. If the victim lunges toward you, react as follows:

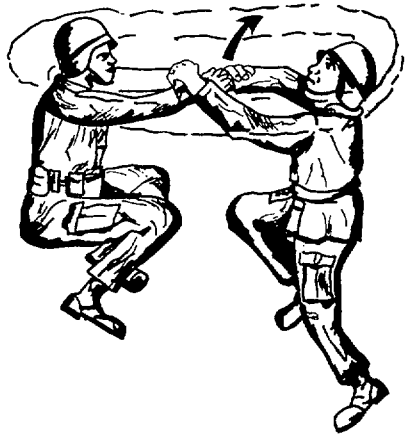
1. Place an open hand against victim's upper chest.
2. Lean backwards and submerge rapidly. Keep blocking arm extended.



3. Swim underwater away from the victim, and return quickly to the surface.
4. Reassess the victim's condition from a distance of 6 feet.
5. Determine an appropriate course of action.

Wrist Escape

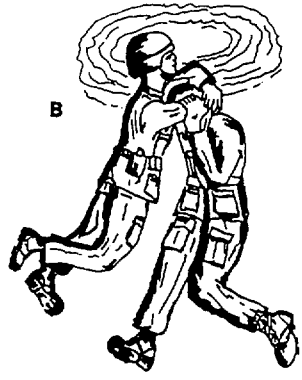
The wrist escape is used when a victim grabs your arm or wrist. If a victim grabs your arm or wrist, quickly submerge the victim by reaching across with your free hand and pushing down on the victim's shoulder while kicking upward for better leverage. This leverage allows the rescuer to pull his hand free. You may also reach down with your free hand, grab your other hand, and jerk upward. Swim clear of the victim and reassess the victim's condition.



Front Head-Hold Escape

The front head-hold escape technique allows you to escape from a victim who has thrown his arms around your head and neck. React as follows:

1. Take a quick breath and tuck chin into shoulder while shrugging shoulders upwards. (See A.)
2. Take a strong stroke and submerge instantly. This drags the victim below the water.
3. Grasp the victim's elbows or underside of upper arms. (See B.)
4. Thrust the victim's arms upward and away.
5. Keep chin tucked and shoulders shrugged to protect throat.
6. Swim underwater away from the victim, and return quickly to the surface. (See C.)



7. Reassess the victim's condition from a distance of 6 feet.

8. Determine an appropriate course of action.

Rear Head-Hold Escape

The rear head-hold escape technique allows you to escape from a victim who has thrown his arms around your head and neck. React as follows:

1. Take a quick breath.

2. Tuck chin down, turn head to either side, raise shoulders to protect throat, and submerge with the victim. (See A.)

3. Take a strong stroke and submerge instantly. This drags the victim below the water.

4. Grasp the victim's elbows or underside of upper arms. (See B.)

5. Thrust the victim's arms upward and away.

6. Twist head and shoulders until free.

7. Swim underwater away from the victim, and return quickly to the surface.

8. Reassess the victim's condition from a distance of 6 feet.
9. Determine an appropriate course of action.

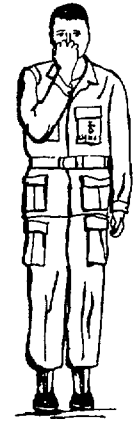
WATER SURVIVAL

As a Marine, you face a variety of potential water emergencies. Ships and amphibious assault vehicles can sink, aircraft can crash at sea, and you can accidentally fall into the water. If properly applied, the techniques described in this section will protect you during water emergencies.

Abandoning Ship

If embarked aboard U.S. Navy ships, you will receive abandoning ship instructions from Navy personnel. Follow those instructions if ordered to abandon ship. Upon receiving the order to abandon ship, report to your designated assembly area. Take the following actions without further orders:

- Put on a life jacket. If the life jacket is inflatable, DO NOT inflate until you enter the water and move away from the ship.
- Remove helmet and gas mask. Remove soft covers and place in cargo pockets for later use.
- DO NOT remove clothing, boots, or shoes.



Use the following steps to abandon ship:

1. Grasp the nostrils firmly between the knuckles of one hand to close the nose.

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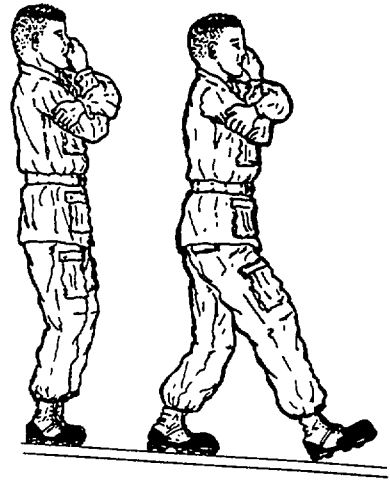
2. Cross free arm over bent arm.

3. Grasp upper arm with free hand to lock bent arm against body.

4. Step to the edge of the ship's deck.

5. Check the water below for debris or survivors. If clear, look straight ahead. If water is not clear, move to another location.



6. Step off the side of the ship with a smooth 30-inch stride when ordered. DO NOT JUMP OFF THE SHIP. DO NOT LOOK DOWN AT THE WATER.

7. Bring trailing leg forward during fall. Lock instep of trailing leg behind ankle of leading leg.

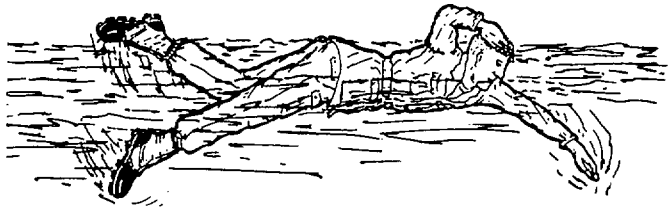
8. Continue looking straight ahead until you hit the water.

NOTE: Looking down at the water causes the body to tip forward in mid-air. This causes the face to strike the water's surface with great violence. This can render you unconscious or cause injuries.

9. Remain in the abandon-ship position until descent has almost stopped.

10. Swim forward and up.

11. Extend one arm (palm up) to feel for obstructions.



12. Move quickly away from the ship. DO NOT LOOK UP AT THE SHIP.

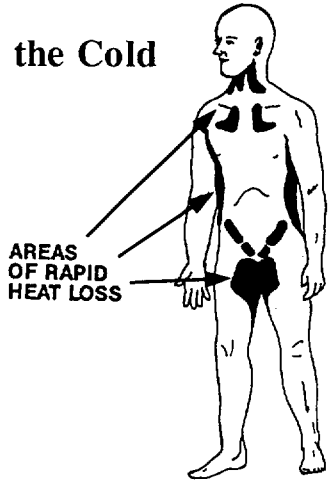
Swimming in Cold Water

DO NOT swim to stay warm. Swimming, even with a slow and steady stroke, produces a lot of heat, and water steals body heat. As a result, swimming produces hypothermia about three times faster than remaining motionless.

SWIM if you have a flotation device and the shoreline is visible.

Individual Protection From the Cold

The head is the single greatest heat loss area. Wearing a life-jacket holds the head above water and reduces heat loss. However, the throat, chest, and groin also lose heat rapidly.



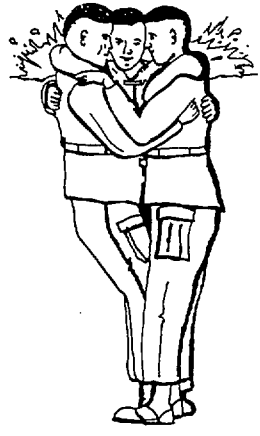
If equipped with a life preserver, use the heat escape lessening position (HELP) to slow heat loss. This position protects major blood vessels near the body's surface. These areas lack insulating fat and are vulnerable to the chilling effects of cold water. The following steps protect vulnerable areas:

1. Tuck chin down tightly to cover throat.
2. Clamp hands tightly inside the armpits.
3. Draw legs up in a fetal position to protect groin.

Group Protection From the Cold

Two or more Marines equipped with life preservers should wedge tightly together. Follow HELP procedures to protect vulnerable areas. Establishing contact with other swimmers provides several survival advantages:

- Eases spotting from search and rescue aircraft.
- Provides additional warmth in cold water.
- Improves morale.
- Reestablishes chain of command.
- Reduces shock and panic.
- Provides opportunity to administer first aid.
- Supports exhausted Marines.



Survival With a Life Preserver

U.S. Navy ships and landing craft issue kapok life preservers. The kapok life preserver is bulky and clumsy, but it will support heavy loads.

CAUTION

Do not cut or puncture the kapok life preserver's protective case. Kapok loses its buoyancy once it contacts water.

U.S. Marine Corps aircraft and amphibious assault vehicles have inflatable life preservers.

CAUTION

Do not inflate the life preserver until clear of the aircraft or vehicle.

Survival Without a Life Preserver

You may be in open water without a life preserver. In that situation, anything that floats can help you survive. Both trousers and shirts are useful flotation devices. As trousers and shirt dry, air leaks out of the legs. To slow this process, occasionally splash water on the fabric.

Floating With Inflated Shirt

You can float by a bubble of air trapped in the shoulders of your shirt. The air rises to the back and shoulders of the shirt and supports you at the water's surface. If needed, apply HELP to reduce heat loss. The following steps produce a bubble of trapped air:

1. Button the shirt's collar button.

2. Open the next lower button.

3. Take a deep breath and bend forward as far as possible.

4. Hold open unbuttoned gap in shirt and blow in air.

5. Repeat with another lung full of air if required.

6. Gather and hold the shirt front tightly in both hands to prevent the shirt from floating too high.

7. Repeat inflation as required.

Floating With Inflated Trousers

In cold water, submerging the head to remove and inflate the trousers results in heat and energy losses that outweigh using trousers as a flotation device. In warm water, trousers can be used as an expedient flotation device. Trousers can be removed and inflated by one of the following three methods. Once inflated, you float motionless as if wearing a life preserver. If needed, apply HELP to reduce heat loss. Reinflate trousers as needed.

Sling Method. The sling method works if you are a strong swimmer or very buoyant. The following steps show proper inflation with the sling method:

1. Take a deep breath, bend over, and remove boots.

NOTE: If you can reach shore, tie boot laces together and suspend boots from shirt or hang them around your neck so they rest on your chest. If you cannot reach shore, drop boots.

2. Remove trousers.

3. Tie a square knot at the bottom of the trousers' legs.

4. Button or zip the fly.

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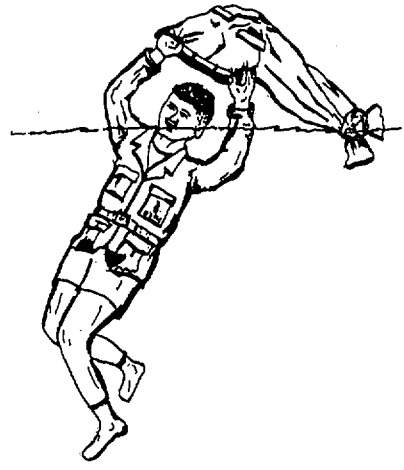
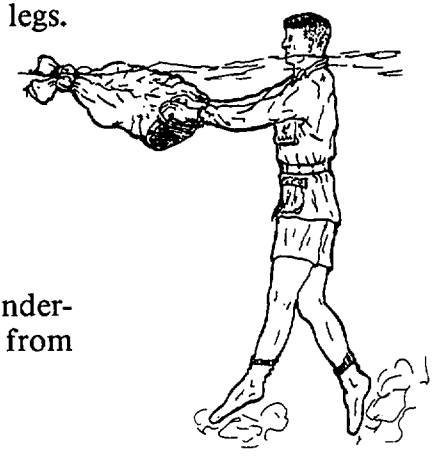
5. Hold trousers above water's surface and behind head. Grasp both sides of the waistband and open wide.

6. Kick strongly to stay on top of water while slinging trousers over head.

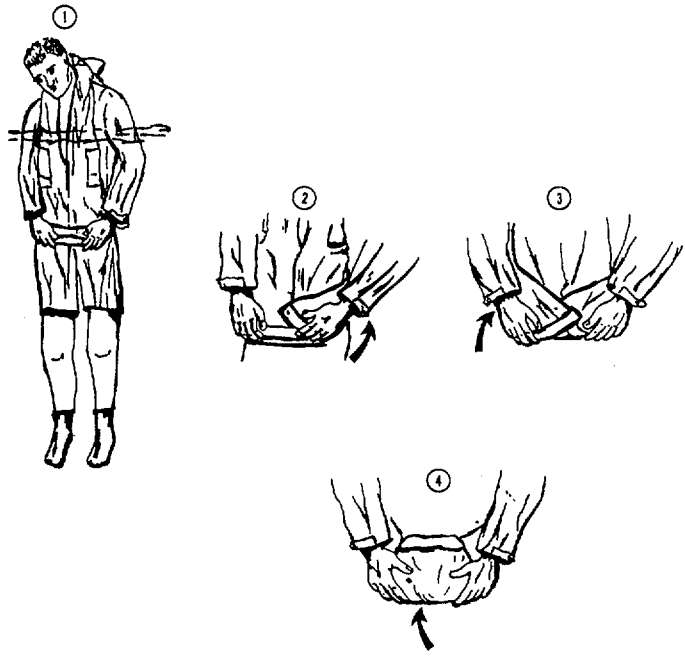


NOTE: This scoops air into the trousers. Once the waistband hits the water, air is trapped in the trousers' legs.



7. Hold waistband underwater to prevent air from escaping.

8. Slip inflated legs over head. Hold rolled waistband against chest.



9. Fold waistband's outside corners toward center to form a point. Fold point upward several times and hold.

10. Rest back of neck against knot.

11. Lie back and relax.

Splash Method. The splash method is an alternative to the sling method. As with the sling method, you must kick strongly to remain at the surface. The following steps show proper inflation with the splash method:

1. Follow steps 1—4 under the sling method.

2. Hold trousers just below water's surface. Grasp both sides of the waistband and open wide.

3. Extend hand 6 inches or more above water's surface.

4. Stroke downward, angling down across the body and toward waistband.

NOTE: This sends a mixture of water and air bubbles into the trousers. The water passes through the fabric, but the air remains trapped in the legs.

5. Follow steps 8—11 under the sling method.

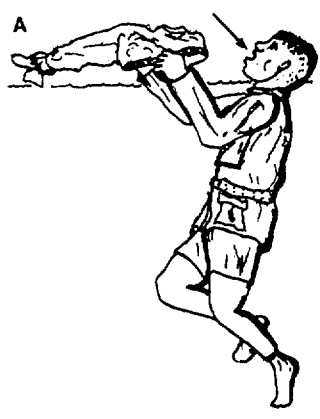
Blow Method. The blow method is an alternative to the sling method. Use the blow method if you are a weak swimmer. The following steps show proper inflation with the blow method:

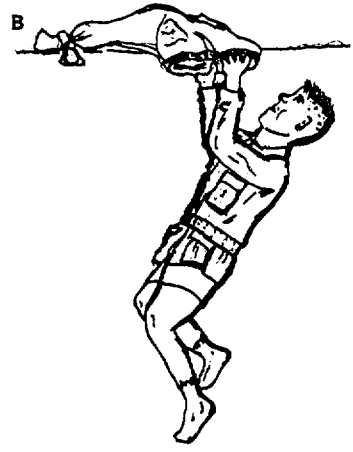
1. Follow steps 1—4 under the sling method.

2. Hold trousers above water's surface. Grasp both sides of waistband and open wide.

3. Take a deep breath. (See A below.)

4. Drop 2 feet below the water's surface pulling waistband underwater. (See B below.)





5. Hold waistband open with both hands and blow air into trousers.

6. Repeat last two steps as required to inflate.

7. Follow steps 8—11 under the sling method.

Survival With a Pack

You also face many water obstacles once ashore. These obstacles include rivers, creeks, lakes, ponds, and canals. Your pack is your key piece of equipment to survive water accidents once ashore. If the pack's contents are properly waterproofed, it can support you (with a combat load) in the water. Buoyed up by the waterproofed pack, you can emerge from the water with all the equipment (e.g., boots, helmet, flak jacket, weapon) you need to continue the mission.

The pack floats because of a physical law known as Archimedes' principle. The principle states that an object submerged in a liquid is buoyed up by a force equal to the weight of liquid displaced (pushed aside) by the object. If the weight of the liquid is greater than the weight of the object, the object floats. If the weight of the displaced liquid is less than the weight of the object, the object sinks.

An object that sinks in water (e.g., a machine gun) still weighs less in the water than on land. Even though a machine gun sinks, it is still buoyed up by a force equal to the weight of water it displaces. For this reason, you should not try to hold yourself or your equipment any higher out of the water than they would naturally float. This wastes energy and body heat.

Items listed in the following table are available through the supply system.

ITEM	NOMENCLATURE	SIZE	NSN
Waterproof bags			TAMLM=V4070
Pistol bag	cover, plastic size #1	8″×18″	8465-00-185-0726
Rifle bag	cover, plastic size #2	10″×56″	8465-00-185-0723
Machine gun bag	cover, plastic size #3	15″×56″	8465-00-185-0724
Multipurpose bag	cover, plastic size #4	20″×84″	8465-00-185-0725
Panama work vest	life preserver, vest		4020-00-555-9006
Small plastic bag	bag, plastic self-sealing	6″×6″	8105-00-837-7754
	bag, plastic self-sealing	12″×12″	8105-00-836-7757
Riggers tape	tape, 2½″ olive drab		7510-00-074-5100
Caulking	sealing compound, temporary seal		8030-00-264-3888
Willie peter bag	bag, waterproof clothing		TAMLN=K4030 8465-00-261-6909

Tape or pad equipment corners and sharp edges. Place items to be packed inside plastic bags. Plastic trash bags work well for bulky equipment (e.g., sleeping bags, field jackets, gas masks, shelter halves). Use small plastic bags for small items (e.g., shaving gear).

NOTE: If the gas mask must be carried outside the pack, cover it with a waterproof bag.

You may have rubberized "waterproof" bags to carry sleeping bags or line compartments of your pack. Often, such bags ARE NOT waterproof. They protect plastic bags, but may leak if used alone.

Tying a Plastic Bag

Do not inflate plastic bags with air. This prevents the bag from bursting if pressed from the outside. Try to remove excess air from the plastic bag. Secure the mouth of the bag.

Packing the Pack

Place plastic bags inside the pack. Handle them carefully to avoid rips. Load sharp items (e.g., tent pegs, poles) to prevent punctures. Place items in pack in order of expected use. Close the pack and its compartments. Attach sleeping mats or bags as high as possible on the outside of the pack.

There is no correct technique for swimming while wearing a pack. You can float nearly vertical and propel yourself forward with bicycle-style kicks and breast stroke-style arm sweeps. You can also use the combat travel stroke which is faster but more tiring. The objective is to move forward and still perform your mission when you exit the water. While in a training pool or during the MCWSP, experiment with various techniques to find the most effective method for you.

Survival Swimming

An object that floats has positive buoyancy. An object that sinks has negative buoyancy. Most people have positive buoyancy and will float at the water's surface. (See ***Buoyancy Test.***) Regardless of whether you naturally float or sink, you can remain at the surface for extended periods without a life preserver if you apply the appropriate survival stroke. The stroke depends on whether you float. (See ***Combat Travel Stroke*** and ***The Sweep.***)

Regardless of which survival stroke you use, apply the following principles. Remember these principles with the word SAFE.

Slow easy movements. Move carefully to conserve energy by minimizing heat loss.

Apply natural buoyancy. Use natural buoyancy to support the body.

Full lung inflation. Fill the lungs with each breath. Do not hold air in the cheeks.

Extreme relaxation. Tight muscles are denser than relaxed ones and do not float as well.

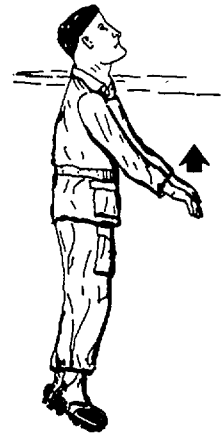
Buoyancy Test

Test yourself for buoyancy in any swimming pool. To check buoyancy, stand in waist-deep water, take a full breath, bend slowly forward, and grip ankles. Relax and wait. If you have positive buoyancy, you will slowly rise to the surface. If you have negative buoyancy, you will sink.

Combat Travel Stroke

The combat travel stroke is the basic stroke for water survival. It permits you to move toward safety and is the best survival stroke if you have negative buoyancy. The combat travel stroke can be performed with or without a pack. A combat travel stroke cycle consists of the following steps:

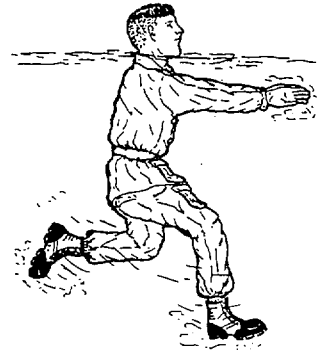
1. Float in a vertical position with legs dangling.



2. Bring hands up, extend arms in front of chest, and begin a slow cycling movement with legs.

3. Hold head out of water. Tilt head slightly back. Breath normally.

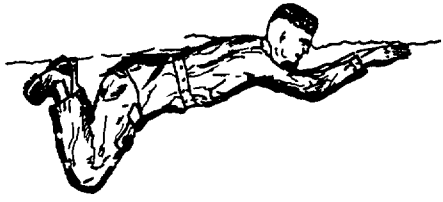
4. Move arms through heart-shaped stroke (the same as the breast stroke). Continue cycling legs.



The Sweep

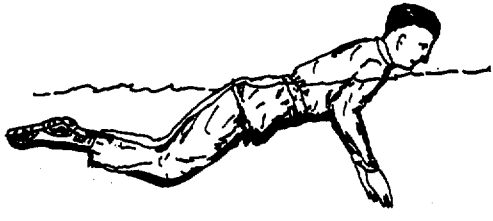
The sweep works well if you have slight to excellent positive buoyancy. A sweep cycle consists of the following steps:

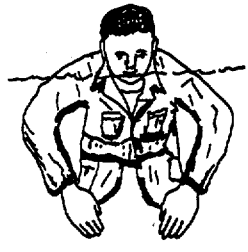
1. Float face down in the water, arms and legs dangling, and head hanging down. Relax all muscles.



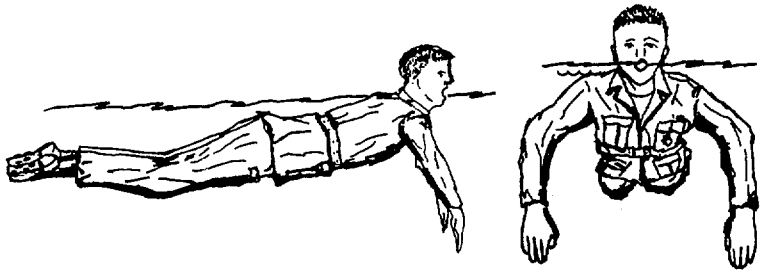
2. Spread feet slowly to prepare for a single kick.

3. Bring hands together, palms down, in front of face.

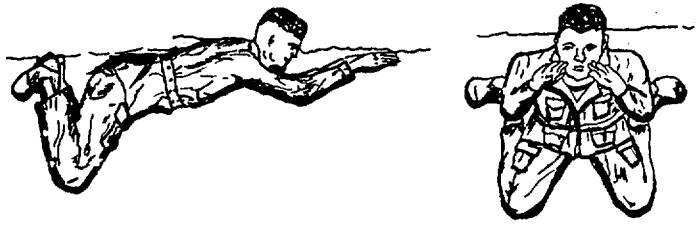




4. Kick feet together and exhale while tipping head back enough to clear water's surface with chin.



5. Bring hands down and to sides while inhaling deeply. Keep fingers together and palms turned downward against water.



6. Rotate head back into water and drop arms downward. Clap hands together in a stroke strong enough to prevent sinking.

Swimming Under Burning Fuel or Debris

Sometimes sinking ships and downed aircraft release fuel. Fuel floats on the surface because it is lighter than water. Move out of floating liquids as quickly as possible. The quickest way to escape floating liquids is to swim into the wind or current. Swimming under burning fuel for an extended distance is one of the most exhausting techniques of water survival. To reduce fatigue, perform underwater swimming strokes as accurately as possible.

NOTE: If you have a kapok or inflated life preserver, you cannot swim under burning fuel. Instead, use techniques for swimming through burning fuel.

If ignited, fuel poses a serious threat. Burning fuel will not harm you if you are below the surface. Escape from burning fuel involves swimming under water until clear of the fire. Perform the following steps if the burning fuel has spread too far to swim underwater in one breath:

1. Submerge to a depth of 6 feet.

   NOTE: This depth is necessary to ensure that the swimmer does not accidentally surface or surfaces too early.

2. Swim forward using a full arm pull until you need a breath.

   NOTE: Trained swimmers use a breast stroke kick. Untrained swimmers use a flutter (scissors) kick.

3. Prepare to surface.

4. Slowly turn the body upward until vertical.

5. Extend arms overhead as far as possible.

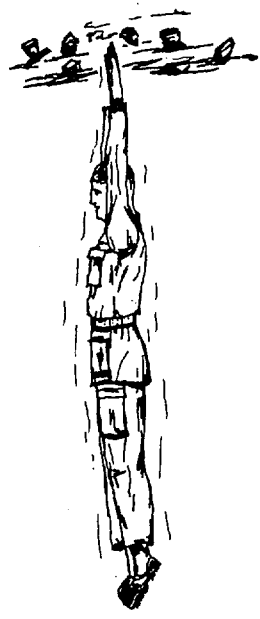
6. Wave arms back and forth vigorously while slowly moving upward to splash a hole. Splash as long as possible.

7. Raise head above water and take one breath.

8. Quickly return below the surface. For extra speed, reach as low as possible, then pull extended arms strongly upward with palms out and up.

9. Return to a depth of 6 feet and continue to swim.

10. Repeat this cycle as often as necessary.



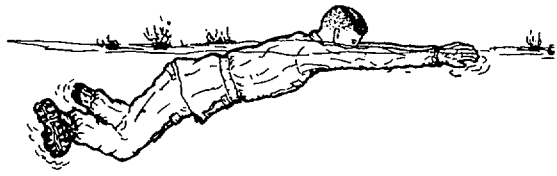
Swimming Through Burning Fuel or Debris

If you have a kapok or inflated life preserver, you cannot swim under burning fuel. Instead, use the following steps to swim through burning fuel or debris:

1. Use a modified breast stroke. Head remains above surface throughout the stroke cycle, and chin is just clear of the water.

2. Swim toward clear area.

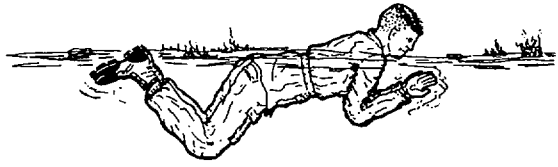
3. Kick legs in a constant frog kick. Unlike a normal breast stroke, this technique has no glide.



4. Use arms and hands to sweep away debris, oil, or burning liquids.

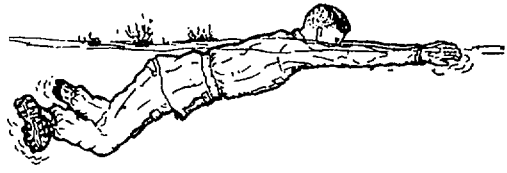
5. Extend arms (palms outward) forward on the surface. Arms are a shoulder width apart.

6. Pull hands in and back toward chest.



7. Stop hands in front of face and rotate so palms face forward (roughly halfway out of the water).

8. Sweep arms forward to a full extension at shoulder width. This splashes debris, oil, or burning liquids aside.



9. Time kicks to coincide with the forward sweep.

NATURAL WATER OBSTACLES

Marines face water obstacles in salt, fresh, or brackish water. Brackish water occurs where fresh and salt water meet. These water environments differ considerably, and create a range of problems for Marine tactical units and swimmers. Saltwater obstacles include tides, surf, and currents. Freshwater obstacles include rivers and canals. Brackish water obstacles include back bays.

Tides

Tides are periodic changes in the surface level of oceans, bays, gulfs, inlets, and rivers. The Moon's and Sun's gravitational pull causes tides. Tides can create (e.g., make rivers too deep to ford) or remove (e.g., cover barriers with enough water for boats or swimmers to pass) obstacles. Direction, level of change, and amount of change determine tidal nomenclature.

Tides that show change in *direction* are flood tides and ebb tides. Rising tides are known as flood tides. Falling tides are known as ebb tides.

Tides that show extreme *levels of change* are high tides and low tides. High tide is the period that water is at its greatest depth. Low tide is the period that water is at its most shallow depth.

Tides that show *amount of change* are neap tides and spring tides. Neap tides have the least amount of change in water level between high and low tide. Neap tides occur at the half Moon when the Sun and the Moon are aligned at a 90 degree angle with the Earth. In this position, the Sun's and Moon's gravitational pull offset each other. Spring tides have the highest floods and lowest ebbs. Spring tides occur at or shortly after the new Moon or full Moon when the Sun, Moon, and Earth are approximately in line. In this position, the Sun's and Moon's gravitational pull are combined.

Surf

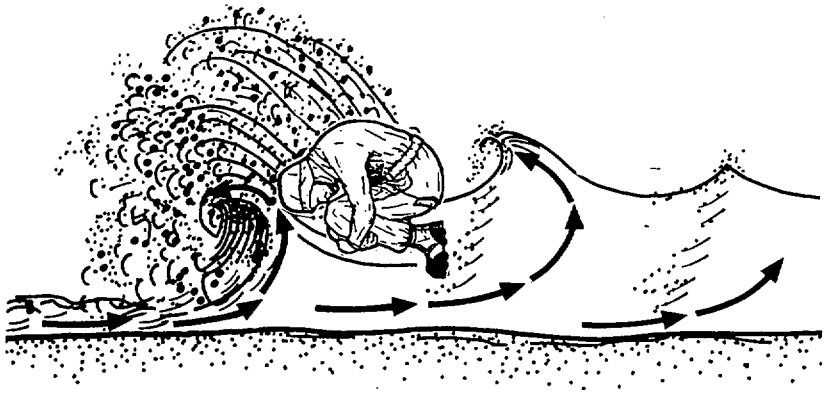
Waves break upon entering shallow water and create surf. The offshore area where waves break is the surf zone. The surf zone presents many hazards. Type of wave determines survival technique.

Wave action moves you toward shore. Lie on your back or side with head pointing in the direction of the beach and feet pointing into the waves. As one wave approaches, another drains away from the beach; relax and do not swim against the draining water. When a new wave is within about 10 feet, start swimming toward shore. Continue to swim until the wave lifts you and moves you toward the beach. Once the wave loses forward momentum, relax and repeat the cycle. If nearing rocks, turn your body and approach feet first to reduce the chance of striking your head and arms.

Breaking waves often trap air bubbles and create a foamy appearance. Bubbles lower the water's density and decrease buoyancy. Move through foamy surf as quickly as possible.

Escaping Plunging Waves

A plunging wave is a breaker whose top curls forward and falls ahead of its base. Because of its power and underwater turbulence, a plunging wave poses the greatest surf threat. If caught in a plunging wave, you can be pulled underwater and pitched about violently. This easily causes panic and increases chances of drowning. Perform the following steps to escape a plunging wave:



1. Tuck into a ball with head against knees and forearms locked around legs just below the knees.

2. Relax in this position until turbulence subsides and you float to the surface. This can take 30 seconds or more.

3. Swim toward shore.

NOTE: If threatened by another plunging wave, dive underwater into the wave.

Escaping Spilling Waves

A spilling wave does not break. Instead, its top slides forward without curling. A spilling wave creates less turbulence and poses less of a threat than a plunging wave. If caught in a spilling wave, relax and let the wave carry you to shore.

Escaping Surging Waves

A surging wave occurs on a beach with a steep underwater gradient. It never really breaks, but the crest rises while the base slides up the beach with great force and speed. Once

the wave reaches its highest point on the beach, it rushes back as quickly as it surged forward. If you are standing on the bottom when a surging wave advances or retreats, the wave can knock you off your feet and pull you into the surf zone. If this happens, get in position for the next wave. Do not try to stand or walk on the bottom. Swim toward the beach as soon as possible.

Currents

Escaping Offshore Currents

An offshore current occurs outside the surf zone. Typically, it occurs at bay entrances, in island channels, and between islands and the mainland. An offshore current flows parallel to or away from shore. If it is created by tides, the current strength and direction vary at different times of the day.

If caught in an offshore current, you may be carried in a direction you do not want to go. DO NOT try to swim directly to safety. If the current is moving directly offshore, relax and wait until the current dies out or turns toward land. Once the current subsides, use the combat travel stroke to swim toward shore. If the current is moving parallel to shore, use the combat travel stroke to move at an angle across the current and toward shore.

Escaping Rip Currents

A rip current occurs when waves pile water against the shore faster than it can drain. The water flows rapidly along the beach until it is deflected seaward by a bottom obstruction. Then the rip current flows through the surf zone and into open water at a speed of up to two knots. This action can cut deep trenches in the sand. A rip current dies out once in open water (usually within a few hundred yards of the shore).

A rip current poses two threats: it can pull you out to the open sea or you can step into a deep trench. If caught in a rip current, DO NOT try to swim against the current. A rip current moves faster than most people swim, and it is impossible to swim to shore once caught. Relax and stay afloat until the current runs out. Once the current subsides, use the combat travel stroke to move parallel to the shore until you are out of the current. Then begin swimming toward shore.

Escaping Longshore Currents

A longshore current occurs when a wave breaks against a beach at an angle. This current flows parallel to the shoreline and does not pose a great threat. If caught in a longshore current, use the combat travel stroke to swim across it at an oblique angle.

Back Bays

Once on the beach, you often face one or more rows of low hills called dunes. Behind the dunes, you may encounter a low-lying stretch of ground thickly covered with scrub trees and bushes. This area gives way to wetlands known as back bays. Back bays consist of muddy islands that are almost submerged during flood tide and separated by channels of brackish water of varying depths. Channel bottoms usually contain soft mud. Back bays pose major obstacles to vehicular traffic. Infantry can cross back bays, but only with great effort. If crossing back bays by foot, consult detailed navigation charts, and use the following guidelines to plan your route:

AREAS TO AVOID

Water less than waist deep. Walking in shallow water or soft mud is extremely tiring.

Back bay islands. Low-lying islands are usually too muddy to support foot traffic.

AREAS TO SEEK OUT

Deep water. Floating with a pack is less tiring than walking through shallow water or soft mud.

Sand, shell, gravel, or stone bottoms. Firmer bottoms ease travel and conserve energy.

Rivers and Canals

A river is a large, natural stream of water that empties into a larger body of water. Slope of riverbed and volume of water determine a river's current.

Canals resemble small rivers or streams in their width and depth, but canals usually lack any significant current. Canal banks may be steep and make exits difficult. (See ***Fording*** section, pages 7-1—7-14.)

FORDING

A ford is any site in a river, stream, or canal where the water is shallow enough for troops or vehicles to cross without using flotation devices. Canal bottoms are usually too soft to support fording vehicles, and wading infantry frequently stumble. Silent crossings are difficult. Station several strong swimmers at the water's edge to help anyone who has trouble crossing.

WARNING

Fords are dangerous. Cross as quickly as possible.

If you lose your footing and fall into the water, swim with the current to the closest shore. Swimming against the current is dangerous and quickly causes fatigue. Cross at an angle against the current.

NOTE: The use of "river" in the following text represents rivers, streams, and canals.

Crossing Calculations

The tactical situation dictates the fording site. Seek fords that are protected from enemy observation and allow adequate supporting fires. A night crossing takes at least half again as long as a daylight crossing.

Determine a Ford's Characteristics

The following table provides preferred fording characteristics.

CHARACTERISTICS	COMMENTS
Concealment	The ford hides personnel and vehicle movement from enemy observation.
Accessibility	The ford should have low banks with gentle gradients. It allows a free flow of traffic at the entrance and exit.
Slow Current	The ford's current should not exceed 1.5 meters per second if possible.
Firm Footing	The ford's bottom, entry, and exit should be firm enough to support traffic. Do not drive a vehicle over any bottom that a 2-inch diameter stick can be pressed into more than 1 or 2 inches.
Gently Sloped Channels	The ford's entry and exit points should be gently sloped. If possible, locate a portion of the stream where the channel is not actively shifting.

Determine Slope

Slope is the amount of change in ground horizontal distance (run) and vertical change in elevation (rise) from one point to another. Slope is usually expressed as a percentage. Units move into and out of the water faster and quieter if entry and exit points are not steep or muddy. You can use a clinometer, map, or line of sight and pace to measure percentage of slope.

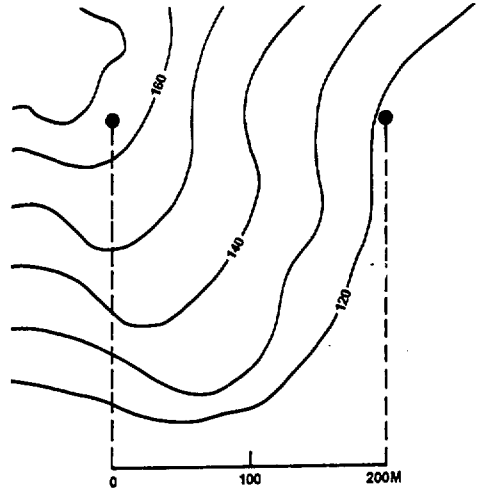
Clinometer. The clinometer is organic to most engineer units, and quickly measures percentage of slope.

Map. A map measures horizontal distance along a desired path. Determine difference in elevation between the path's starting and ending points. Both figures must be the same unit of measure (e.g., feet, meter, etc.). Divide the elevation (rise) by the distance (run), and multiply by 100.

Rise=165−120=45 meters

Run=200 meters

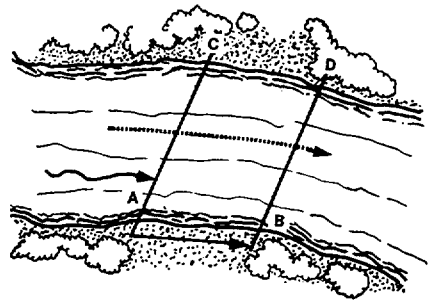
% slope= $\frac{45}{200} \times 100 = 22.5\%$



Line of Sight and Pace. Use the eye-level height above ground (usually 1.5 to 1.7 meters) and the length of a standard pace (usually 0.75 meters). Stand at the bottom of the slope. Keeping eyes level, pick a spot on the slope. Pace the distance. The number of paces times 0.75 meters gives run. The eye-level height (1.5 to 1.7 meters) gives rise. Repeat this procedure for each spot (vertical and horizontal). Add vertical distances to provide total rise and the horizontal distances to provide total run.

Determine Current Speed

Current speed increases in narrow channels. It may be necessary to locate a wider ford to obtain a slower stream current. The following steps calculate current speed:



1. Measure distance between points A and B.
2. Sight directly across the water from points A and B to locate points C and D.
3. Throw a floating object (e.g., a stick) upstream from points A and C.
4. Record the time needed for the object to float from point C to point D.
5. Calculate current speed as follows:

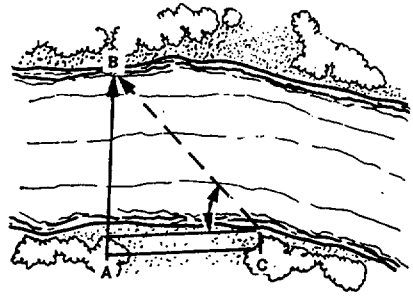
$$\frac{\text{Distance (meters) between points A and B}}{\text{Time (seconds) between points C and D}} = \text{Current Speed (meters per second)}$$

NOTE: In peacetime training, do not attempt to swim across currents faster than 1.5 meters per second. Equivalents of this speed include:

- Quick time march rate of 120 counts per minute with one 30-inch step at each count.
- 5 feet per second.
- 3.5 miles per hour.
- 5.5 kilometers per hour.

Measure River Width

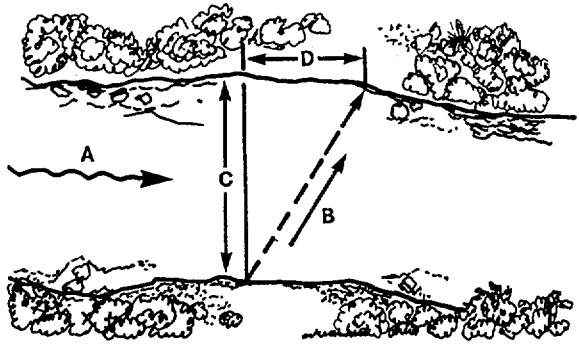
Determining a river's width is usually more difficult than determining similar distances on land. A river's width can be estimated from the width of its symbol on a scaled topographic map. If this is not possible, use the following compass techniques:



1. Stand at the water line (A).
2. Shoot an azimuth to a point on the opposite bank (B).
3. Move upstream or downstream until you can shoot an azimuth 45 degrees larger or smaller than the original azimuth (C).
4. Measure the distance between points A and C. The distance equals the river's width.

Calculate Downstream Drift

A river's current causes personnel and equipment to drift downstream. Personnel and equipment crossings must compensate for the effects of a river's current; i.e., entry is usually made upstream of the desired exit point. Personnel and equipment are *aimed* straight across the river; however, the current produces a *sideslip* downstream of the forward movement. Use the following to calculate downstream drift:



$$\frac{\text{Current Speed (A)}}{\text{Crossing Speed (B)}} \times \text{River Width (C)} = \text{Downstream Drift (D)}$$

NOTE: The crossing speed for a swimmer across a river may vary, but is generally limited to 1 meter per second. All measurements must be in the same unit of measure (e.g., meters, feet, etc.).

Buddy System

Pair every Marine in a unit with a swimming partner. The buddy system matches an experienced swimmer with a weak swimmer. The experienced swimmer assists and encourages the weaker swimmer, and reduces fear during night crossings. If a unit has an odd number of Marines, put the extra person with another pair to form a three person team.

Care of Weapons

Marine infantry weapons and munitions are designed to operate after immersion. However, take precautions to protect your weapons.

Gas-operated weapons can malfunction if water travels down the barrel and enters the gas tube. Close the weapon's bolt before entering the water. Seal the muzzle with a condom, balloon, plastic spoon wrapper, or other waterproof material. Tie or melt the protective cover to create a watertight seal.

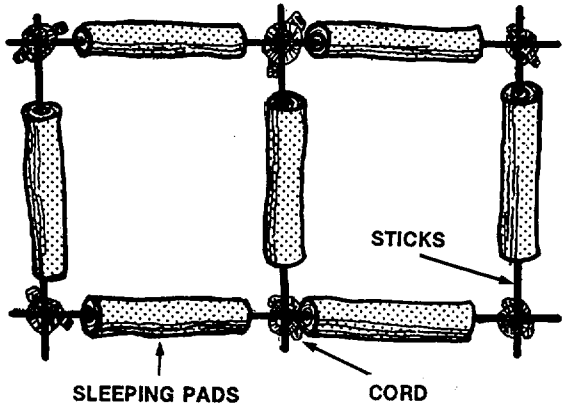
Remove the muzzle's protective cover. Open the bolt and inspect the barrel. If the tactical situation permits, swab out the barrel. Test fire automatic weapons if possible. Field strip and clean weapons as soon as possible. If time does not allow proper inspection, rinse inaccessible portions in diesel fuel.

ISOMAT Raft

Construction of an ISOMAT raft is time-consuming. It should not be employed as part of an attack. Use an ISOMAT raft for logistic purposes (e.g., evacuating stretcher cases, transporting supplies). Use the following steps to build an ISOMAT raft:

1. Wrap ISOMAT sleeping pads around sturdy sticks.

2. Use parachute cord and square knots to tie the pads securely in place and to lash stick ends together in a rectangle.

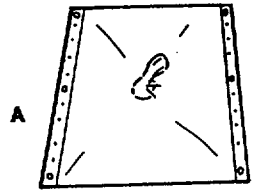


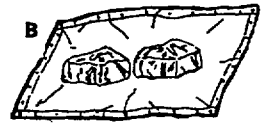
NOTE: The ISOMAT raft pictured above can support several hundred pounds. The cargo will get wet if not properly waterproofed.

Poncho Raft

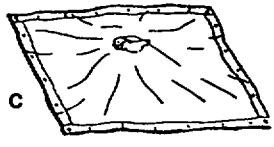
Use a poncho raft for long crossings. A poncho raft can support two Marines and their equipment. Use the following steps to build a poncho raft:

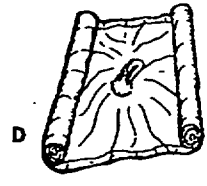
1. Inspect ponchos and ensure they are serviceable.
2. Lay one poncho flat on the ground, rubber side down, and hood up.
3. Cinch hood tightly to form a *gooseneck.* (See A.)
4. Pad sharp edges of equipment and place in center of poncho. (See B.)





5. Place the second poncho over the equipment, rubber side up, and hood down.
6. Snap edges together. (See C.)
7. Roll edges toward equipment. (See D.)

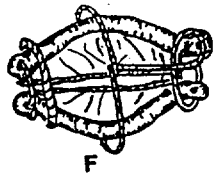




8. Roll edges into pigtails and tie off. (See E.)

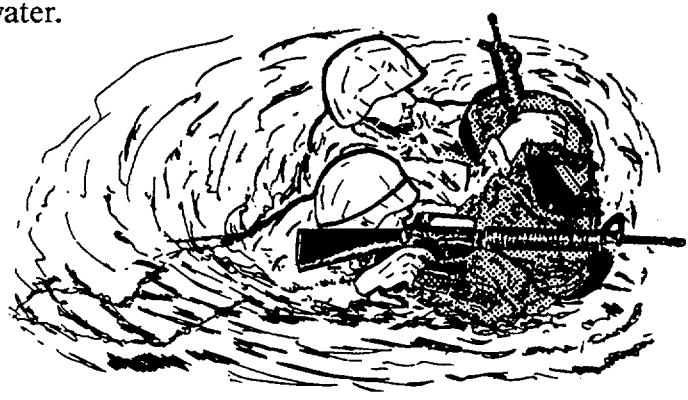
9. Pull pigtails together over the top and lash securely. (See F.)

E



F

10. Protect raft from brush punctures while placing in the water.



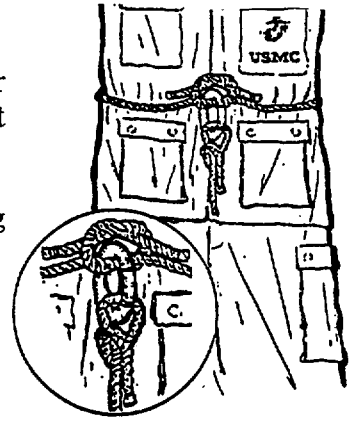
Single-Rope Bridge

A single-rope bridge offers a temporary and quick way to cross streams and small rivers. A single-rope bridge provides extra security while crossing swift streams. At night, it prevents straggling, and guides units from one side of the river to another. Provide at least one single-rope bridge per platoon at night.

Construction

Use a squad-sized bridge team to construct a single-rope bridge. Use a nylon rope to cross gaps less than 20 meters. Use a manila rope to cross gaps larger than 20 meters.

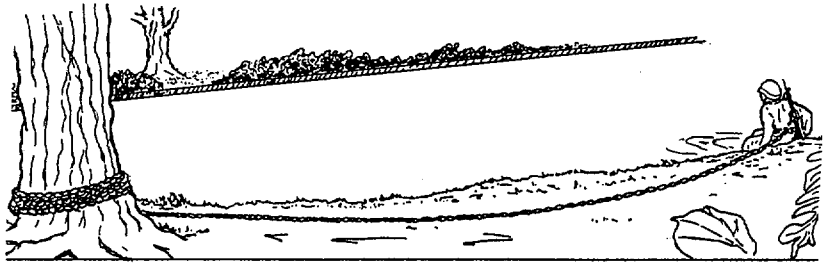
Nylon rope is coiled in 120-foot lengths. It is 7/16 inch in diameter, and has a breaking strength of about 3,840 pounds when new. Over time, a nylon rope stretches to as much as 1/3 more than its original length. Stretching weakens the rope. If it is stretched, discard or use for light tasks. To prolong the life of a nylon rope, do not step on it or drag it on the ground. Pad the rope in places it contacts rocks or sharp corners. Do not leave rope knotted or stretched longer than necessary. Dry rope as soon as possible. Single-rope bridge construction is as follows:



1. Tie a sling rope around your waist using a square knot and two half hitches.

2. Attach a snaplink to the sling rope.

3. Tie a bowline in the running end of the bridge rope and attach it to the snaplink.

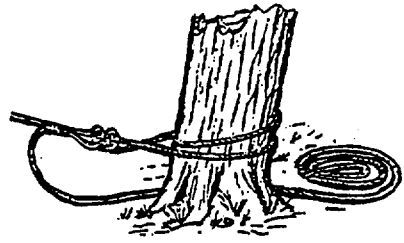


4. Enter and cross the water.

NOTE: Carry only your weapon and ammunition.

5. Exit the water.

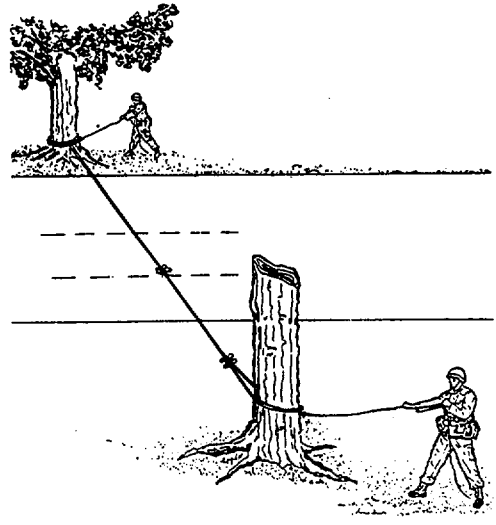
6. Prepare weapon for use. Unhook bridge rope from snaplink, and tie bridge rope to a sturdy tree using a round turn and two half hitches.



7. Conduct a box reconnaissance of the opposite shore.

8. On the near shore, prepare to tighten rope. Pull rope across and temporarily secure to an anchor point without tying a knot.

9. On the near shore, place a transport tightening system in the bridge rope by tying a double butterfly knot and placing two snaplinks in the butterfly.



10. Pass the running end of the bridge rope around the downstream side of the near side anchor point and through the two snaplinks.

11. Pull the butterfly knot approximately a third of the distance across the river and secure the bridge rope to an anchor point using a round turn and two half-hitches.

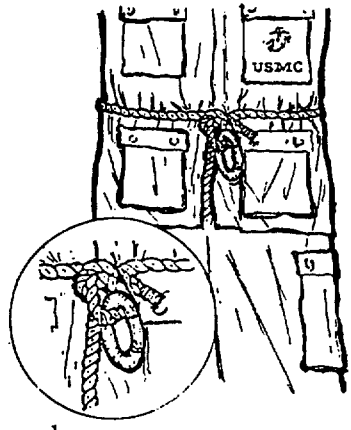
12. On the near shore, pull the slack out of the bridge rope until the butterfly knot is back on the near side. Tie

bridge rope off against itself using two half-hitches with a quick release in the last half-hitch.

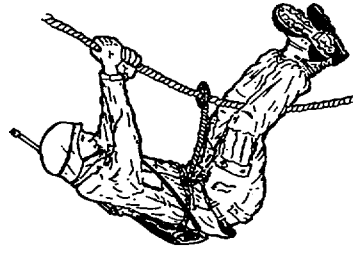
NOTE: The bridge must be as tight as possible so it will not sag when used.

High and Dry Crossings

If the single-rope bridge is high enough, suspend yourself below the single-rope bridge and above the water. Use the following steps to suspend yourself from a single-rope bridge and pull yourself across the water:



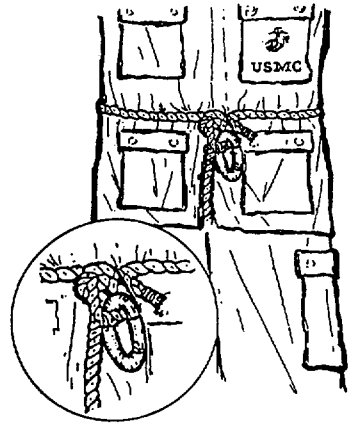
1. Tie a sling rope around your waist using a bowline. Ensure knot is evenly tight.
2. Attach a snaplink through the bowline's loop. Snaplink's gate faces up.
3. Secure helmet chinstrap.
4. Face the bridge with left shoulder toward far shore.
5. Grasp bridge rope in both hands.
6. Swing body beneath bridge with head toward far shore. Cross ankles above bridge rope.
7. Arch back until snaplink contacts bridge rope. Connect snaplink to bridge rope. Allow snaplink to bear body's weight.
8. Pull across bridge, hand over hand, to the far shore.

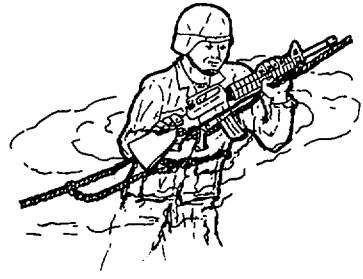


Swift Current Crossings

A single-rope bridge prevents being knocked down and swept away by a swift current. Use the following steps to move through a swift current:

1. Tie one end of sling rope around waist using a bowline.
2. Tie running end of sling rope in another bowline, and attach a snaplink to bowline's loop.
3. Step up to bridge. Face upstream.
4. Hook snaplink to bridge.
5. Walk sideways into river while grasping bridge rope in both hands.
6. Use the bridge for balance, and remain standing if possible.
7. Continue to move sideways through the river to the far shore.





Slow Current Crossings

If you face little or no current, it is not necessary to hookup to the bridge rope with a snaplink. Lie on your back in the water beneath the bridge. Support body weight with your waterproof pack. Pull yourself across hand over hand using the bridge rope.

Removal

The final Marine remaining on the near shore waits until all personnel have crossed the single-rope bridge. He then pulls on the standing end of the rope to release the knot, and ties the rope around his waist using a bowline. Marines on the far shore pull him through the water.

Appendix A

Combat Water Survival/Qualification Standards and Test Procedures

(Excerpt From MCO 1510.29B)

1. The following qualification standards and test procedures are applicable to Marine Corps combat water survival training. All testing procedures of CWS-3, CWS-2, CWS-1, and WSQ will be accomplished while wearing full combat gear unless otherwise stated. *Full combat gear* will consist of boots, utilities, helmet, flack jacket, H-harness, cartridge belt, two magazine pouches, two full canteens with covers, rubber rifle, and a standards 40-pound pack, with frame, which has been properly waterproofed. Gas mask, first-aid kit, magazines, isopor mats, and sleeping bags will not be used during testing or training.

a. Combat Water Survival, Third Class CWS-3. To qualify Marines as CWS-3 involves teaching and testing. Emphasis is on personal survival under combat situations and while on maneuvers. Teaching takes place throughout.

(1) Enter shallow water with weapon and wearing full combat gear.

(2) Walk 20 meters in shallow water with weapon at port arms.

(3) Walk 40 meters in chest deep water wearing full gear and weapon (weapon slung around neck) using a modified breaststroke arm movement while continuing to walk.

(4) Walk 60 meters in neck deep water with full gear and weapon (weapon slung around neck) using a modified breaststroke arm movement while continuing to walk.

(5) Travel for 40 meters in deep water with full gear and weapon.

(6) Jump from height greater than 30 inches and less than 6 feet, using the modified abandon ship technique, into deep water with full gear and weapon (weapon inverted at sling arms); travel 10 meters, remove pack, and travel 15 meters with pack and weapon.

(7) Jump from minimum height of 10 feet using the abandon ship technique wearing utilities and boots only and travel 25 meters.

b. Combat Water Survival, Second Class (CWS-2). Skills developed to a level of being capable of assisting a wounded Marine to safety as in a river crossing. Must have completed CWS-3.

(1) **Step 1:** With full combat gear minus pack and weapon, assist a weak or injured Marine wearing the same equipment to safety, by towing the Marine 25 meters using a collar tow. Victim may assist.

(2) **Step 2:** Move 25 meters with equipment as in step 1 above to retrieve two packs, two weapons (secured to packs) and return the 25 meters to where the other Marine is waiting.

(3) **Step 3:** Reverse and let other Marine do steps 1 and 2 above.

(4) With full combat gear minus pack, travel for 50 meters in deep water with weapon slung across back.

c. **Combat Water Survival, First Class (CWS-1).** Demonstrate ability to rescue yourself, assist a victim/distressed swimmer to safety, and survival under adverse situations. Must have completed CWS-2. Steps 1 through 6 will be executed in sequence wearing only the utility uniform.

(1) **Step 1:** Properly demonstrate the following survival strokes:

(a) 25-meter breaststroke.

(b) 25-meter side stroke.

(c) 25-meter elementary backstroke.

(2) **Step 2:** Underwater swim 25 meters in simulated oil burning situation. To do this, Marines will use the splash recovery technique.

(a) Students enter the water, feet first, by entering from the pool deck and swim until a breath is needed.

(b) Stop all forward movement by assuming a vertical position.

(c) Place hands over Marine's head and splash vigorously on the way up and through the surface allowing the head and shoulders to break the surface.

(d) Once head surfaces, the Marine quickly inhales a breath of air and submerges again. This procedure will be executed for a minimum of 2 or maximum of 4 times.

(3) **Step 3:** Rescues (dry land drill, water demonstration, and student practice time of all three rescues). Students must properly demonstrate each rescue for qualification. (Victims will be passive during carry or tow.)

(a) Front head hold escape, front surface approach, collar tow for 25 meters.

(b) Rear head hold escape, rear approach, double armpit level off, cross chest carry for 25 meters.

(c) Wrist grip escape, front surface approach, wrist tow for 25 meters.

(5) **Step 4:** Blouse inflation/survival float for 1 minute.

(6) **Step 5:** Trouser inflation/back float for 1 minute.

(7) **Step 6:** Swim 250 meters using one or a combination of survival strokes.

d. **Water Survival Qualified (WSQ).** A prerequisite to water survival qualification is successful completion of the CWS-1. To be water survival qualified, a Marine must—

(1) Jump from minimum height of 10 feet, the abandon ship technique, with full combat gear (weapon inverted at sling arms).

(2) Remove pack, assume a reconnaissance position on the pack, and traverse 25 meters.

(3) Back float, drownproof, or tread water in deep water with utilities and boots for 30 minutes without artificial flotation. Boots will be removed after 5 minutes and retained. Five minutes prior to completion of the thirty minute float, and without exiting from the water, replace the boots and swim 500 meters using one or a combination of survival strokes.

2. The additional water survival qualification (flight physiology training) and requalification required of personnel assigned to flight status will be conducted in accordance with *OPNAVINST 3710.7* and CNO ltr OPSF/hlm SER917 POS of 15 Sep 70. Survival qualification (first class CWS-1) in accordance with NAVPERS 15791B, paragraph 6610120 and this Order is a prerequisite to water survival (flight physiology) training and is a one-time requirement.

a. **Combat Water Safety Swimmer (CWSS).** This skill level enhances an individual's ability to assist in water survival situations. The CWSS qualified Marine assists the Marine combat instructor of water survival (MCIWS) during the *MCWSP.*

Qualification Standards. Qualification standards currently under development.

Test Procedures. Test procedures currently under development.

b. **Marine Combat Instructor of Water Survival.** This skill level certifies an individual to perform MCIWS duties. The MCIWS trains and certifies unit personnel in the MCWSP (CWS-3 through CWSS). The MCIWS provides water survival advice to the commander and his staff.

Qualification Standards. Qualification standards currently under development.

Test Procedures. Test procedures currently under development.

c. Marine Combat Instructor Trainer of Water Survival (MCITWS). This skill level certifies an individual to perform MCITWS duties. The MCITWS trains, certifies, and supervises the MCIWS. The MCITWS ensures proper administration of the MCWSP. The MCITWS performs MCIWS duties if required.

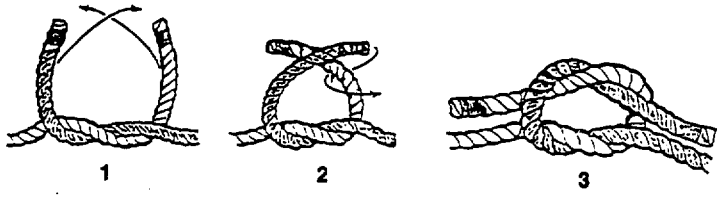
Qualification Standards. Qualification standards currently under development.

Test Procedures. Test procedures currently under development.

Appendix B

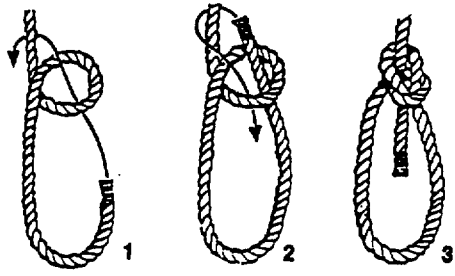
Knot-Tying Terms

Square Knot



The square knot ties ropes of equal diameter together so they will not slip.

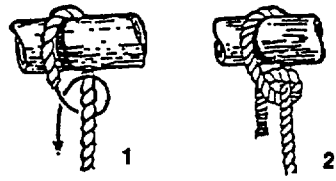
Bowline



The bowline forms a loop that will not tighten or slip under strain. It is easily untied.

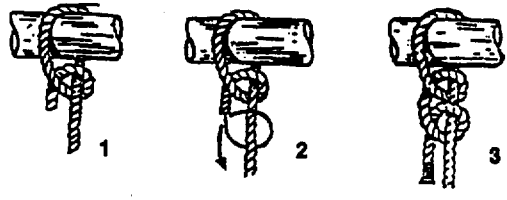
Hitches

Half Hitch



The half hitch ties a rope to a tree or to a larger rope. It will hold against a steady pull, but is not a secure hitch. It is frequently used to secure the free end of a rope.

Two Half Hitches

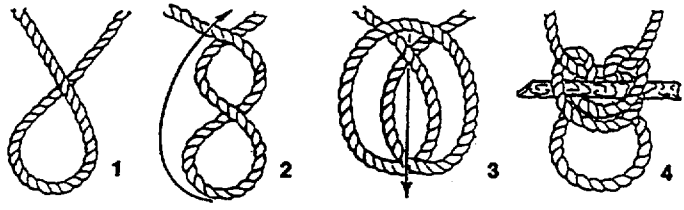


Two half hitches secure the running end of a rope.

Round Turn and Two Half Hitches

A round turn and two half hitches fasten a rope to a tree. This hitch does not jam.

Butterfly Knot



The butterfly knot pulls a bridge rope taut. This knot tightens a fixed rope when mechanical means are not available. It will not jam if a stick is placed between the two upper loops.

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Appendix C

Glossary

CPR ..... cardiopulmonary resuscitation
CWS-1 ..... combat water survival, first class
CWS-2 ..... combat water survival, second class
CWS-3 ..... combat water survival, third class
CWSS ..... combat water safety swimmer

HELP ..... heat escape lessening position

MCITWS..... Marine combat instructor trainer of water survival
MCIWS ..... Marine combat instructor of water survival
MCWSP..... Marine combat water survival program

WSQ..... water survival qualified

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Appendix D
References

Fleet Marine Force Reference Publication (FMFRP)

FMFRP 4-52	First Aid

Field Manuals (FMs)

FM 90-5	Jungle Operations
FM 90-13	River Crossing Operations

Technical Manual (TM)

TM 5-725	Rigging

U.S. GOVERNMENT PRINTING OFFICE : 1994 O - 152-620